NGINEERING ROOM

En 5

ELECTRICITY on the FARM

The National Magazine of Rural Electrification

MARCH

Culbertson Electric Farm Shop
Electric Farm Aids in 1943
Chick Brooding Reminders
Design of Mow Hay Finishers
A Fifteen-Hen Laying House
Pig and Lamb Brooders in Penn.
Housewives Study Cook Stoves

1944

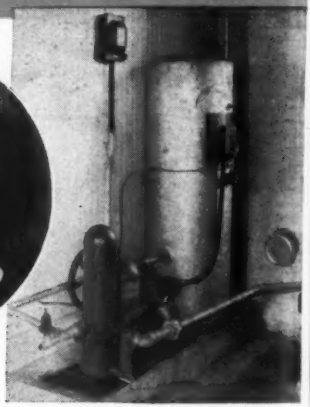
A CASE · SHEPPERD · MANN PUBLICATION

MAR 14 1944
OREGON STATE COLLEGE

MORE MILK with LESS LABOR

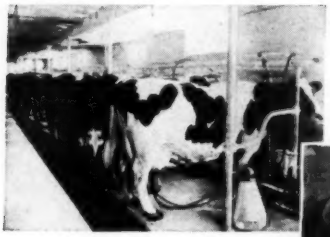
WHEN YOU USE "Wired Hands"

Milk production goals for 1944 are higher than ever. This electric equipment will help you increase milk production in spite of farm-labor shortage.



WATER SYSTEM

Running water in the dairy barn pays big dividends. When water is always available, cows produce from 10 to 20 per cent more milk containing from 6 to 12 per cent more butterfat. An extra pint of milk a day pays the power cost for a large herd. The automatic water system eliminates pumping and carrying water—a big saving in labor.



MILKING MACHINE

An electric milker makes possible a time saving of at least 45 per cent, or as much as 70 per cent with large herds. With a double-unit milker, one man can milk from 2 to 4 cows in the time formerly required to milk one by hand. With proper use of an electric milker, you can increase production from 5 to 15 per cent. And the cost is low—only 3 to 5 cents to milk a cow for *one month*.

MILK COOLER

Milk at 95 degrees as it comes from the cow must be *immediately* cooled to below 50 degrees to prevent rapid multiplication of bacteria. Electric refrigeration is the safest, surest, and most economical way to do it. The cooler makes high-quality milk production possible and saves hours of labor formerly required to haul and store ice. The cost is about ¾ cent or less per gallon of milk cooled.

This electric equipment is available for farmers who need it to increase their milk production. See your local Agricultural War Board for priority. For helpful advice on the care of your present equipment, write for "Maintenance Tips for Your Electric Farm Equipment." Address General Electric Company, Section 303-14, Schenectady, N. Y.

INVEST IN YOUR FUTURE—BUY WAR BONDS

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Proper watering of 4 dairy cows, and correct sanitation in barn and milk house, can increase your milk check over $60 a year — a substantial payment on a milking machine or a refrigerator.

Plenty of water means bigger egg production. The additional income from 100 laying hens can total as much as $70 a year — extra money for a radio or washing machine.

Faster gains are made by livestock when plenty of water is available. Extra weight gained by 20 hogs can yield as much as $80 — money for more war bonds or a trip to see your boys in camp.

"We've found an EASY WAY to make MORE MONEY"

Most money that's made on the farm comes the *hard* way. But there is an *easy* way to produce from 10 to 15% more meat — 5 to 10% more milk — and 10 to 20% more eggs. A dependable Myers Water System makes this possible.

Moreover, think of the time and labor you can save! No more leg-work with heavy water buckets — no more arm-work to fill stock tanks — when you have running water in your barn, feed lots and poultry house. By installing a completely automatic Myers Water System — with automatic watering cups and tanks — you can keep fresh, clean water before your farm animals continuously, *without even lifting a finger*. Yes, that's the *easy* way to make more money and save precious hours.

But that's not all. Once you have a Myers, you can easily run pipe lines to kitchen, bathroom and laundry and bring the greatest of all city conveniences to country living. Plan now to own a lifetime Myers Water System. Get this essential *productive* equipment *first* — it will help you pay for "those other things."

WARTIME MAINTENANCE AND PLANNING: To help you keep present pumping equipment operating, mail coupon for free book on care and maintenance; also water system book to guide your postwar planning.

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Editor's Chat

HAY

We again present articles on the mow hay finisher. We offer no apology. We will have more. Having spent several years in visiting and studying all types of hay driers and in aiding the development of this mow "finisher," we are ready to crusade for this simple, small-farm method of producing hay of better feeding and sales value.

Nature's method of stock feeding is grass feeding. In attempting to improve on Nature or speed her processes, man is prone to overlook or omit some important factors. After years of travelling in a circle, strewn with difficulties, and salted with vitamins, minerals and hormones, we pull up alongside of Nature again and take another look. In the case of Nature's grass, we decide that we have missed a few things; the leaves, for instance, and the stuff that makes the green color, and the juices that got rained and dewed out. You can interpret them as vitamins, protein and minerals; or as a better diet for cows to produce better milk for more sturdy calves; or just as $5 per ton.

The farmers who have been using these hay finishers are the best judges of what they are worth. In the territory where Mr. Koontz works, the number has increased each year. He believes in them from living with the farmers who have used them.

There is still much more to learn. We know that young grasses are best. Prof. Curtis of Cornell has also found that grasses cut in the late afternoon contain more digestible nutrients than if cut the following morning. Mr. Koontz reminds us that one can usually tell by mid-afternoon whether it is going to rain that night.

With a way to finish partially cured hay in the mow at a reasonable cost, the door is open for one of the niceties of farm management that can make farming more intriguing and more profitable.

DEMOCRACY IN WARTIME

With all of the faults and weaknesses of a democracy, it is a government *for* the people; and the people who live under it would not trade it for any other government in the world. The question is, what to do about it in wartime.

War is not democratic business. It cannot be. Trained military leaders must make the plans; dictate the methods. Soldiers must obey. An efficient war organization must be a dictatorship.

In this war, we have gradually granted additional powers to our Commander in Chief. He now has still too little power to be most effective as Commander in Chief, but far too much power for a president of a democracy. Complete mobilization for war, with universal service for soldiers, labor, farmers, office workers, manufacturing plants and capital might have shortened this war, had it been put into effect immediately when war was declared. Universal service at this stage looks like a political play. It's too late to mend the muddling.

Isn't it time for us to admit that we must have one type of government for peacetime and an entirely different government for war—and provide for it in advance. A democracy for peace; a Martial Board for war, with a provision that the Board and all its dictatorial powers shall begin with the declaration of war and end within a specified time after the conclusion of peace. Such a Board should be composed of men trained and experienced in war and in industrial and agricultural production; not political adherants. It should be provided for by Constitutional amendment; not by presidential appointment. The President would be a member but not dictator, or Commander in Chief of the Army and Navy. War is increasingly a technical and not a political undertaking.

Such an arrangement should tend to keep us out of war, make us more potent and effective when war is unavoidable and insure a return to democratic government when war ends.

Geo. W. Kable

ELECTRICITY ON THE FARM
The National Magazine of Rural Electrification

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1944 Rural Electrification Contest Starts Now

4-H boys and girls are proving that electricity increases food production with less farm help.

The aim of the boys and girls in the National 4-H Club Rural Electrification Contest is to find ways of using *electricity . . . to save labor and increase production.*

Here's proof . . . typical examples from the official 4-H reports . . .

A Nebraska 4-H boy installed a small electric pump for garden irrigation, and the family had a plentiful supply of fresh vegetables when neighboring gardens were killed by drought.

A 4-H girl in Mississippi showed the value of electrifying the dairy, and now $10 worth of electricity saves $60 in labor, $30 in ice, and 30 gallons of gasoline.

A Georgia 4-H girl hastily built an electric pig brooder when a sow farrowed in unseasonable weather, and saved the whole litter.

A 4-H boy in Michigan helped rig up a portable electric fence, which makes extra pasturage possible after crops have been cut.

In Utah, a 4-H girl made an egg candler; the elimination of sub-standard eggs makes the whole production bring higher prices.

Scores of boys have adapted portable motors to run churns, feed grinders, fanning mills, sheep shears and other equipment, always saving time that is badly needed for other farm work.

Everywhere, 4-H boys and girls are making electricity do more work, *producing more with less available help.*

Get the 4-H'ers in your family to enroll now in the 1944 Rural Electrification Contest. It's a *practical* contest which is immediately useful on your farm. Gold-and-silver pins are awarded to County winners; State winners receive a free trip to the National 4-H Club Congress in Chicago; $200 Westinghouse scholarships are given to the six National winners.

Your County Agent has full information about the Contest. Mail the coupon for helpful materials.

Rural Electrification, Westinghouse Electric & Manufacturing Co., 306 Fourth Ave., P.O. Box 1017, Pittsburgh 30, Pa.

Tune in John Charles Thomas, NBC, Sundays, 2:30 p. m., E.W.T.

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Plants in 25 Cities *Offices Everywhere*

DONALD JESSEE, ILLINOIS, attaches a motor to the corn sheller, adds many hours to the time he has for other necessary work on the farm.

JEAN HOWINGTON, GEORGIA, not only keeps home appliances in order but has built an egg candler, chick and pig brooders, demonstrated dehydrators.

GLENN EISENBRANDT, ILLINOIS, increased egg production with water heaters made from two cans and an ordinary electric light.

FREDERICK PICKETT, JR., RHODE ISLAND, rewired his home, installed exterior lighting, and put in an electric water system.

WESTINGHOUSE ELECTRIC & MFG. CO., (Dept. EF-34)
Rural Electrification, 306 Fourth Avenue,
P.O. Box 1017, Pittsburgh 30, Pa.

I want to enter the 1944 4-H Club Rural Electrification Contest. Send information, and free bulletins.

☐ Check here if you are a club leader and wish material for the use of your Club members.

Name .....

Street or R. D. Number .....

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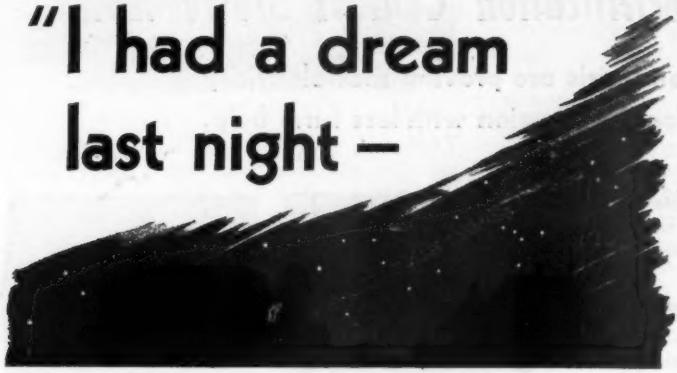
"I had a dream last night —



- - - Harry was home from the war and helping with the spring plowing. I could see him sitting opposite me at the kitchen table gobbling down a third helping of meat and potato pot-pie, just like he used to do. We were quiet for a bit . . . all of us just silently thankful for being back together again, when Dad said, 'Harry, I know the war has got you used to the finest kind of modern machinery. If I was to make some improvements around here, what would you like most?'"

"Harry spoke right up and said, 'Dad, I'd like most awful well to not have to pump another bucket of water. Seems to me I've spent half of my life pumping water for the stock and for the kitchen and even for watering the garden.

"'I used to get a big kick out of working on one of those army mobile laundry units. They had a Goulds pump that pulled wa out of deep or shallow wells springs and ponds and cre faster than we could use it. O of those outfits could d mighty swell job around here would increase our milk, me and egg production and save a heap of time and money.'"

There's where Mrs. Mille dream ended, but we too ha been doing a bit of dreaming a planning that will relieve you the aching, back-breaking t of pumping and carrying wa ---tons of water in weather frigid that you must hack hol in the ice for the livestock or sweltering summer days aft long hours of working in you fields or haymow.

Whether you obtain your wat from a deep or shallow well— regardless of the capacity yo require, there's a Goulds wate system to fit your need. Proba bly you'll want Goulds Jet-O Matic, the fastest selling, mos compact and most economica pump on the market. It has onl one moving part, can be use for either deep or shallow wel service, and is foolproof an trouble-free.

You may be able to secure on of these right now because the are available in limited quanti ties. Write for the name of you nearest Goulds dealer. He'll b glad to tell you all about th many exclusive features of th Jet-O-Matic. GOULDS PUMP INC., Seneca Falls, N.Y.

ELECTRICITY on the FARM

ELECTRICITY: *Versatile Energy for Many Farm Uses*

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MARCH 1944

The Culbertson Electrified Farm Shop

By LOREN D. CAREY
The Toledo Edison Company
Bryan, Ohio

ELMER CULBERTSON, who lives two and one-half miles north of Bryan, Ohio, and his 18-year-old son Ralph, give their farm equipment good care. They have constructed a farm shop building and equipped it economically and thoroughly. The building is 24′ x 30′ with 10′ sides and has large doors in one end for taking farm equipment in and out. The concrete floor is easy to keep clean, and an old stove furnishes heat to make it comfortable.

Each year, during the slack season, all farm tools are inspected and overhauled if they need it. In this way years are added to the life of the machinery, and when work in the field is to be done, the tools are ready. Mr. Culbertson says his shop is more valuable to him for keeping things in good condition than as a place to fix breakdowns. Keeping the breakdowns as low as possible, and the machinery working during seeding and harvesting, means less loss of profit, and a great deal of satisfaction.

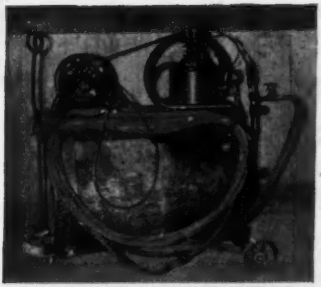
Another way the shop has been profitable, is in reconditioning used machinery purchased at farm sales. For example, a mower purchased for $10 with $5 worth of repairs, a little adjustment, and a coat of paint was made almost like new. A new mower would have cost $175.

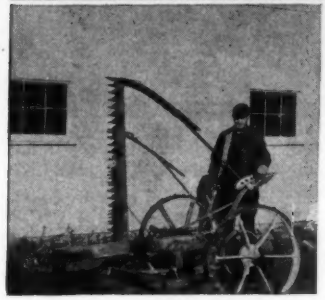
Mr. Culbertson says his most useful tools are his electric arc welder and a ½-inch speed drill. The arc welder saves time during the busy season, as many repairs can be made on the machines without dismantling. This saves repair parts, much labor tearing down and reassembling, as well as trips to town. The speed drill is equipped with a stand, so it can be used in place of a post drill. By loosening one thumb screw the drill can be easily removed.

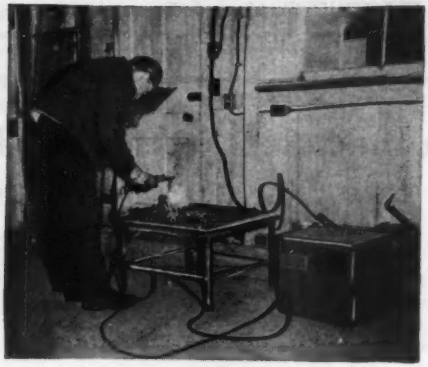
One of the most useful pieces of power shop equipment is a high-speed tool grinder. In this shop there are three. Two are operated with ¼ hp motors. One has a stone suitable for sharpening small tools, another has a sickle grinding wheel and the third is a ½-hp grinder for heavy duty work. This motor is mounted on rails so that it can be easily detached for other jobs. In all three emerys the grinding wheels are mounted on separate shafts, the stands being home made. Long shafts and small pulleys permit

Left: The Culbertson's shop building. Note the wide doors and the outside light over the entry. **Center:** Mr. Culbertson using the electric stand drill. It may be quickly taken out of the stand and used as a portable drill.

Behind him are the bins for storing spare parts, clamps, etc. Right: Left to right are table saw and several grinders for special jobs and the wood lathe. The A-frame with its chain-block is used for lifting engines and machines.







Above: The electric welder has its own work table of a convenient height for working on parts. **Upper left:** This is the home-built portable air compressor mounted on a three-caster frame which can be easily moved about the shop. The compressor and ½ hp motor are mounted on a platform on top of the air tank. The motor can be lifted off to use for other jobs. **Lower left:** This mowing machine was purchased at a sale for $10. With $5 worth of parts and paint and some repair work, it was almost as good as new. A new one like it would have cost $175.

free movement of the parts being ground.

Another ¼-hp. motor has a home made sander attached. The sander is a flat wooden disk, covered with sand paper, fastened to the motor shaft.

An air compressor that had been discarded as worn out was purchased for a few dollars, and has been made over into a portable unit. The compressor and a ½-hp. motor are mounted on top of an air storage tank which is all placed on castors so it can be moved any place about the shop as needed.

A 7-inch table saw with ½-hp motor helps with repairs to implements and buildings. There is also a ¼-hp. wood lathe. These power tools with a good assortment of hand tools make up the equipment of the shop.

Some of the jobs that have been done in the shop include assembling a buck rake with power lift from old auto parts, a two-gallon ice cream freezer driven by a ½-hp. motor through "V" belts and pulleys. Parts are being collected to make a 20-foot ear corn and grain elevator according to plans in the September issue of ELECTRICITY ON THE FARM.

There is good wiring and lighting in this modern shop. Heavy wires from the main entrance switch supply both 115 and 230-volt current to the distribution cabinet in the shop. From there wires lead out to convenient outlet boxes arranged along the walls. The 230-volt outlet boxes are of the heavy duty polarized type so that it is impossible to place the common 115-volt plug in the higher voltage outlet. There are two stationary lights controlled by wall switches. One is high above the large doors and floods the entire building. The other is on an arm with reflector attached above the work bench and furnishes light for close work.

On the wall adjoining the work bench are rows of bins of ample size for repair parts, bolts, etc. They can be found when needed.

Ralph, who is a Senior in High School, has taken a very active part in the planning of this shop building. It gives him a place to put in practice some of the things he has studied in farm shop in school.

CHICK BROODING REMINDERS

There will be more electric brooders available this year than were available last year. Completed brooders and heating elements and fan units for homemade hovers may be had.

The chief advantages of electric brooding are (1) Reliability and reduced worry from fire hazard, fires going out, etc.; (2) Less labor; (3) Better, faster feathering chicks; (4) Clean; (5) Automatic regulation under all weather conditions; (6) Often costs less than other heat.

These advantages do not come, however, just by buying a brooder and plugging it in. Electric brooding is different from coal or oil brooding. You must change your methods and devote a little study to proper operation just as you did when you changed from the old coffee pot to the electric percolator. Electric brooder operation is simple, but it is different.

Electric brooding is cold room brooding. Chicks must be taught in the first day or two, to go under the hover to get warm and come out to feed. They should be confined close to the hover for a day or two by boards, heavy paper or wire barriers. Raise the hover and get them out to eat. They learn quickly.

Give the chicks plenty of fresh air by ventilating the house well. Just avoid floor drafts. Cold floors are usually damp floors. They should be tight and warm; double if possible. Peat moss or ground corn cobs make good litter.

Inspect your brooder, wiring, extension cord, thermostat wafer and contact points and see that they are in good condition, clean and sanitary well in advance. Operate the brooder for a day and adjust the thermostat before the chicks come out. Adjust the thermostat thereafter by the comfort of the chicks—not the thermometer. Brooder thermometers are not always accurate.

Be sure the wiring to the brooder house is adequate so you will have full voltage at the brooder. Advise your power supplier that you are using electric brooders so they can repair any possible power outage quickly. Alarms which ring a bell if the power goes off are available.

Electric Aids to Farm Production in 1943

Second Group of Letters from Our Readers on How Electricity Helped Them With Their Farm Work Last Year

From a Kansas Farm Boy

"Who likes to get up early and work late at night prowling around in the dark? I don't. But a forty watt bulb gives me light and ambition.

"Our chickens depend on electricity all the time, day and night. A lamp gives the night shift of hens all the light they need to increase production up to the limit of their ability. A one-third horsepower motor grinds the grain for them. An electric motor runs the pressure pump and saves 30 minutes of dragging water to the chickens every day.

"While harvesting the grain a one horsepower motor blew the grain into the bin. One man could unload it in one-third the time he could scoop it.

"These days mom puts patches on overalls as big as cannon-balls with her electric sewing machine."

LEON ENSZ, CONWAY, KANSAS.

$20 for Watering Garden

"I was helped by the water system we have to water my garden when the few weeks of hot, dry weather hit us last summer. I had hose enough to reach the garden and watered it enough to keep the pickle patch from dying until the rains started. I picked something like 4000 pickles off of just two short rows. Pickles brought 50c per 100, so that was $20 worth. It did not take much more than a half hour each of the two times I watered the garden, so I feel that I made a pretty good profit."

MRS. MAE DEHAVEN,
RD 4, HUNTINGTON, INDIANA.

4-H Club Boy Improvises Brooder; Earns $80

"Last spring I wanted to have a 4-H poultry project. New brooders were hard to get and we had only one electric brooder, then in operation. However, we did have some brooder hovers left over from old coal burning brooders. We made a makeshift brooder. It really worked quite well. . . . The heating units consisted of lamps buried in two eight-quart pails filled with sand which had been preheated.

"Of 102 chicks, 2 died the first day (the runts), 5 were stepped on by livestock, and one was killed on the highway. At the 4-H poultry show I received 2 firsts and 2 thirds. To date I have sold nearly $80 worth of poultry and have 42 of the pullets in the laying house."

W. M. ABBOTT,
RFD 1, MORRISON, ILLINOIS.

Enables Me To Be Postmaster

"A little over a year ago I was appointed postmaster in my home village. I could never have filled my job at home as homemaker and be postmaster without the aid of my electric stove and refrigerator. Now I can prepare the foods and keep them so I can get meals quickly. I store surplus meats at hog killing time and vegetables at other times in the refrigerator and can them on the electric stove during my leisure time. With my electric helpers, I can fill two jobs."

MRS. MARY OWEN, SEDLEY, VA.

Boys Work With Electricity

"Since the labor shortage we were forced to buy an electric milker, and it has saved us both time and money. We can now milk twice as many cows in the same time. Our two boys, 8 and 10, with their father do the milking, and feed the 20 milk cows, 10 calves and one bull. Before, we hired two men."

MRS. BEN MARTIN,
R 2, GRAHAM, NORTH CAROLINA.

The Martin boys and electricity take the place of two men.

Welder Repairs Machinery

"I saved my time, money and tires by using my electric welder to repair our own machinery. I am a certified electric welder. That left the new parts available for someone else. I would have had to make a six-mile trip to an already busy shop, or 15 miles for new parts for my combine, tractor or other machinery."

ELMER L. JOHNSON,
RFD 4, WACO, NEBRASKA.

Nothing New; But It Helped

"I don't believe we would have been able to farm and produce the food we have without electricity. It wasn't any new or spectacular equipment, but just the availability of the ordinary equipment that helped.

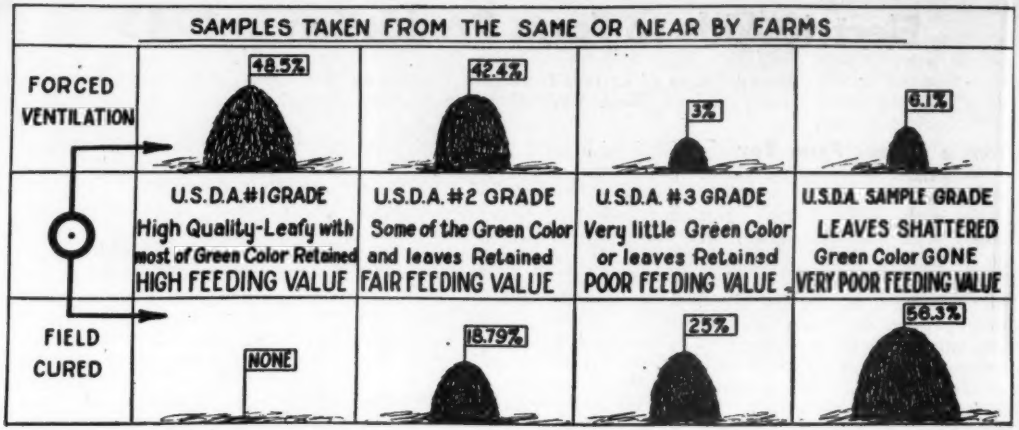
"We raised our chicks in an electric brooder. They were healthy and grew so fast, and we could sleep because we did not worry about fire. Our water system kept plenty of water for our cattle, hogs, horses and chickens, —and no hot summer pumping or livestock neglect in freezing weather. Lights helped produce more eggs, aided in doing the chores after dark, and machinery could be repaired at night. The refrigerator saved food and enabled us to prepare for several days at a time. Electricity helped us most by just being at our side day after day when we needed it."

MRS. HERMAN CORDS,
JANESVILLE, MINNESOTA.

Wife Did the Milking

"Cooking, washing, ironing, water pumping, milking and milk cooling,—almost everything—on our farm is done with electricity. This summer I milked 14 cows at night which enabled my husband to stay in the field as long as he wished, without a thought of the milking and without hiring a hand."

MRS. JUNE L. ENGLE,
RR 3, BLUFFTON, Ind.



Comparisons of results on the grade of hay when mow cured and field cured. This summary is based on 49 samples in the 1942-43 seasons. Mow cured hay was consistently one or two grades better. Grading was based on per cent of leaves, per cent of green color and per cent of foreign materials. The first two factors were influenced definitely by the curing method.

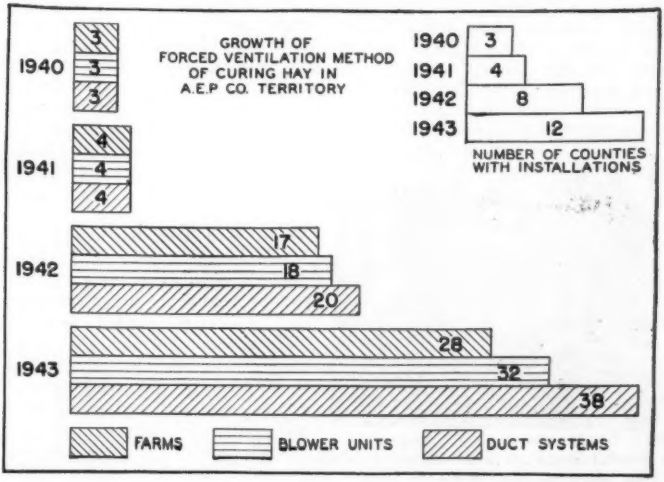
Mow Hay Curing in Virginia

Progress Report from a Territory That Now Has 38 Mow Hay Finisher Installations

By **L. L. KOONTZ**,
Appalachian Electric Power Co.,
Bluefield, W. Va.

MOST Virginia farmers know that a hay crop loses value when cured in the field. Occasionally the entire crop is lost. In 1942, a survey of hay losses was made on 215 farms in nine Southwest Virginia counties. The farmers stated that 25 percent of their hay crop was lost or damaged. Usually the weather conditions throughout the haymaking season are not favorable for curing quality hay in the field.

Starting in 1940 with three units in Southwest Virginia, the number has now grown to 38, with prospects for quite a few more in 1944. Based on personal experience, farmers are well pleased with results. The grade of hay, its money value and its feeding value have been much improved over field curing. Mow curing has eliminated the danger of loss due to unfavorable weather.

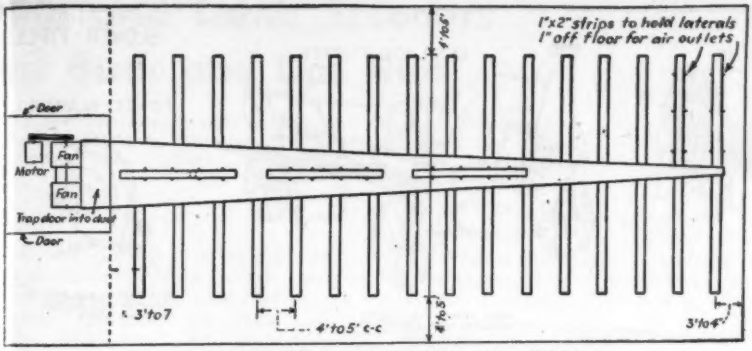


The total labor in handling the hay for mow curing is no more and in many cases is less than in the field curing of hay.

Mow storage capacity is increased approximately 50 percent by using the forced ventilation curing method.

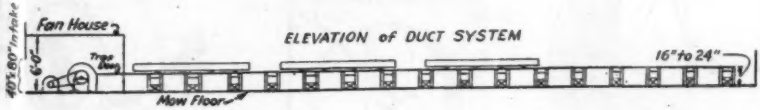
A forced ventilation hay drier costs from 15c to 20c per square foot of mow floor area. The complete cost of systems now in use on Virginia farms varies from $50 for a ½ hp motor size up to $550 for the largest systems that use 7½ hp motors. This cost includes lumber, blower unit, labor, electrical materials, pulleys, belts and one-half the cost of the motor. Standard hay handling equipment usually found on Virginia farms is all that is needed in addition to the duct system and the blower. The side delivery rake and hay loader speed up operations in the field, but they are not necessary for successful operation. The grapple type hay fork works better than the harpoon type for

. . . . . (More on page 20)



PLAN OF FAN and DUCT SYSTEM on MOW FLOOR

File for reference



Design Factors for Mow Hay Finishers

THIS article gives certain information about the design of mow hay finishers which may be helpful to agricultural engineers who are called upon to design this equipment.

The mow hay finisher is relatively simple to construct and operate. It must, however, be properly designed for the particular mow in which it is to be used if it is to do the job satisfactorily.

We strongly recommend to any farmer contemplating the installation of a drying system that he obtain the services of a qualified agricultural engineer, preferably one who has had some experience with driers. It may also save waste of money and materials if you will visit one of these finishers and talk to its designer before starting your own construction.

Purpose of the Finisher. The purpose of this mow duct and fan system is to finish the curing of hay that is partially cured in the field. When the day is favorable, hay is cut and cured from 4 to 8 hours in the swath. This usually reduces the moisture content from around 75 or 80 percent down to 40 or 45 percent. The remaining 25 or 30 percent to bring the hay to a satisfactory storage content of 20 percent is removed by the finisher.

The advantage is in the saving of leaves, green color, nutrients and aroma, and sometimes the saving of complete loss from rain damage. The mow-cured hay grades higher as measured by U. S. standards or "milk in the pail."

The finisher does not make good hay out of a weedy, low quality crop. The greatest advantage comes from finishing high quality legume hay.

The Duct System. The duct system consists of a main duct and laterals. These must be properly designed so that the air will be evenly distributed to all laterals. It is best to have the laterals the short way of the mow (in large mows) and the main longitudinally down the center. The size of main and laterals will depend on the size of the mow.

The Main Duct should be completely enclosed—top, bottom and sides—with dressed lumber and be smooth on the inside. If the mow floor is smooth and airtight, it will serve as a bottom. The main will conduct air under pressure and must be airtight. There should be no bends in the ducts unless absolutely necessary. Bends interfere with uniform air distribution and greatly increase the power requirements.

The main should decrease in size from the blower to the end of the mow in proportion to the laterals which lead from it. It may be made of uniform height (about 16" to 24") and the reduction made by sloping the sides inward to a width of 9" to 12" at the end.

In order to save power and get good air distribution the ducts should be made of such dimensions that the air velocity through them shall not exceed 1,200 to 1,400 feet per minute.

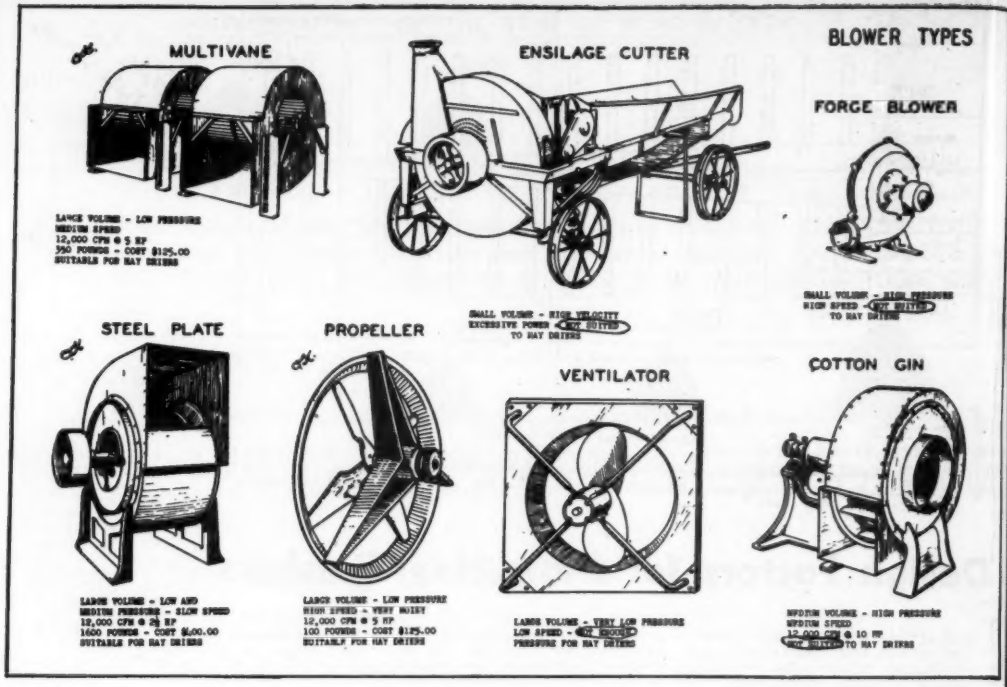
Lateral Ducts should be spaced 4 to 5 ft c-c on opposite sides of the main with the end ducts 3 to 4 ft from the wall.

Lateral Construction: 1"x12" boards are customarily used for tops and 1"x6" to 1"x10" boards for sides. Bottoms are open. For more even air distribution, the tops of the laterals can be sloped from about 3" less than the full height of the main to a height of 6" at the outer ends. Laterals are supported on 1"x2" cross strips laid on the mow floor. This holds the sides and end 1" above the floor which provides the air outlet into the hay at floor level. Laterals should extend only to about 4 or 5 feet from side walls of the barn, and 6 or 7 feet from an open-end mow. They should have airtight connections to the main.

Amount of Air Needed. Finishers in use supply from 8 to 20 cu ft of air per minute per square foot of mow area. Twelve cfm per sq ft may be taken as an average value. A mow 20x40 feet would, therefore, call for a blower with an air delivery of $20 \times 40 \times 12 = 9{,}600$ cfm.

Blowers or Fans. Air must be delivered into the duct system in sufficient volume and under enough pressure to force it through the duct system, out of the openings and up through the hay. In order to supply this volume and pressure, multi-vane blowers are customarily used. Some finishers have been equipped with propeller type blowers specially designed to operate against pressure. The pressure is small. For a typical 28 x40-ft mow with smooth ducts having no bends and an air requirement of 10,000 cfm, a blower that would operate against a pressure of ⅜" of water was necessary (pressure to hold up a column of water ⅜" high, equivalent to about 0.2 oz per sq in). While this pressure is small, if you double it by added friction and bends, a different blower requiring twice as much power would be necessary. Roughness inside the ducts increases this pressure. One 90° bend in the main supply duct would increase the power requirements about one-third.

Blowers must be carefully selected to provide the required air volume, and pressure at the prevailing temperature. If you try to use a blower against more pressure than it was designed for it will not deliver its rated volume of air and you may have hay spoilage. The exact speed at which blowers run is important. Duct design is important. These are some of the reasons why expert engineering advice is needed. In


BLOWER TYPES
MULTIVANE
LARGE VOLUME - LOW PRESSURE
MEDIUM SPEED
12,000 CFM @ 5 HP
350 POUNDS - COST $125.00
SUITABLE FOR HAY DRIERS
ENSILAGE CUTTER
SMALL VOLUME - HIGH VELOCITY
EXCESSIVE POWER - NOT SUITED TO HAY DRIERS
FORGE BLOWER
SMALL VOLUME - HIGH PRESSURE
HIGH SPEED - NOT SUITED TO HAY DRIERS
STEEL PLATE
LARGE VOLUME - LOW AND MEDIUM PRESSURE - SLOW SPEED
12,000 CFM @ 2½ HP
1600 POUNDS - COST $600.00
SUITABLE FOR HAY DRIERS
PROPELLER
LARGE VOLUME - LOW PRESSURE
HIGH SPEED - VERY NOISY
12,000 CFM @ 5 HP
100 POUNDS - COST $125.00
SUITABLE FOR HAY DRIERS
VENTILATOR
LARGE VOLUME - VERY LOW PRESSURE
LOW SPEED - NOT SUITED TO PRESSURE FOR HAY DRIERS
COTTON GIN
MEDIUM VOLUME - HIGH PRESSURE
MEDIUM SPEED
12,000 CFM @ 10 HP
NOT SUITED TO HAY DRIERS

normal times, some blower manufacturers will provide engineering assistance.

Intake and Outlets. Air to the blower should be supplied from outside the mow so the moist air will not be blown back into the hay. Large openings from the mow above the hay must also be provided for the free escape of the moisture laden air. These openings should be about 10 times the capacity of the main duct.

Motors. 230 v repulsion-induction motors should be used. The power required will depend on the air volume, air pressure, and fan, belt and duct efficiencies. V-belt drives are best.

Depth of Hay Permissible. Placing the Hay. Single layers of hay should not exceed 8 feet in depth. After this layer is completely cured another layer may be placed on top of it. For best results, the total depth should not exceed 15 or 16 feet, although it is reported that depths as great as 24 feet have been cured.

The hay must be placed *uniformly over the entire duct system* or the part of the system not covered must be shut off. Do not stand in one spot or drop the hay in one spot in filling the mow. Uniformity of placing and packing is essential to insure even curing and to prevent hot spots.

Blower Operation. The blower should be operated continually during the day when humidity conditions are such that the air will take up moisture from the hay. At night, and when the humidity in the air is very high, force air through the hay only as needed to prevent heating. Blowing for one hour at five-hour intervals will usually accomplish this. The hay will be dried to 20 percent moisture content in from 7 to 14 days.

Automatic Control. Periodic blowing may be done without personal attention by using a time switch and relay to control the motor. More elaborate controls may include a humidistat for starting the motor whenever the outside relative humidity drops to a predetermined point of, say 50 percent, and stopping it whenever the relative humidity rises to 70 percent. Temperature controls may also be placed within the mass of hay to start the motor or sound an alarm when critical temperatures are reached. In finishers which have been installed, manual control has given satisfactory results.

Finisher Costs. Virginia installations cost from $50 for a ½ hp unit to $550 for large systems using 7½ hp motors. These cost include lumber, blower, electric wiring materials, pulleys, belts and one-half the motor cost. It ranges from 15c to 20c per square foot of mow area.

The kw-hrs used per ton in Virginia in 1942 varied from 32 to 96, averaging 53. The blowing time, and hence the power cost, increases as the depth of hay increases.

Availability of Equipment. Blowers can be purchased now only on priorities and the number available is limited. Motors are available on priorities. A limited amount of wire is available.

General Observations. The hay finisher is still relatively new. Improvements in design and use may be expected. You will have to use your own judgment in changes in operation to fit your own requirements, different types of hay, different climatic conditions.

Some hay containing as much as 80 percent moisture has been put in barns and cured reasonably well. Some has been put in after being cut only 2 hours. One farmer speeds his drying by using air warmed by a furnace.

Dr. Curtis of Cornell University has found that hay cut in late afternoon may contain from 10 to 25 percent more digestible nutriments than the same hay cut the following morning. In certain localities afternoon cutting may be practical when using a mow finisher. While the system is new, it is best to play safe and follow practices which have proved successful.

There have been no fires reported in any of the 70 or more barns using mow finishers.

Authority. This statement has been prepared by Geo. W. Kable, who was in charge of the hay drier research for T. V. A. at the time this mow finisher was developed. It has been checked and revised by Mr. John A. Schaller, Agricultural Engineer, T. V. A., Knoxville, Tenn., who did much of the development work, and by Mr. L. L. Koontz, Agricultural Engineer, Appalachian Elec. Power Co., Bluefield, W. Va., who has been responsible for many of the 45 Virginia installations.

Pig and Lamb Brooders at Buck and Doe Run

Brooders Are Simple and Sturdy. Brooders and Barriers Are Quickly Installed and Easily Removed for Cleaning and Storage. Mazda Lamps Serve as Heaters

By **STANLEY BIDLACK**

TEN year averages, published by the United States Department of Agriculture, indicate that hog prices usually reach their peak in September. The next highest period comes in March.*

At the Buck and Doe Run Valley Farms in Chester County, Pennsylvania, a system is followed of raising two litters a year from each sow. The first comes early enough in the year to have the pigs ready for the best fall market.

Early spring pigs are a problem. Losses from chilling and crushing are high for pigs farrowed in cold weather. The Buck and Doe Run Valley Farms solve this problem by using twenty-four electrically heated pig brooders. These reduce losses from chilling to practically nothing, and cut down the number crushed or stepped on very materially.

The pig brooders are built for easy handling and storing. The pens are equipped with stout guard rails. The brooder tops, which are made of light weight tongued and grooved boards, rest on top of the guard rails in the corners of the pens. The tops are triangular in shape with one square corner. The sides from this corner are about four feet long.

An ordinary 200 watt Mazda lamp, with a metal reflector is the heat unit for these brooders. An opening is cut in each brooder top, slightly smaller in diameter than the reflector base. This is covered by tacking a piece of one-half inch mesh, hardware cloth to the under side of the brooder top. The reflector sets on the top over this opening.

To keep the sow from climbing up on top of the brooder a stout barrier, about two or three feet high, is placed over the front edge, and above it. This is fastened to the wall by means of a pair of hasps and staples. One man without help can set up the brooders very quickly, and just as quickly take them down and store them.

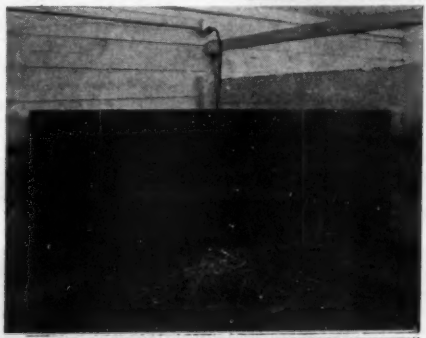
The pigs are sheltered by the brooders a little longer than is the usual farm practice, although the length of time depends upon the weather. The brooders are used about three weeks, the lamps being left on all the time for that period. This appears to give the baby pigs an extra good start.

The demountable feature of these brooders saves time and makes it easy to keep pens and brooders clean. The Buck and Doe Run Valley Farms believe that cleanliness pays in raising hogs, just as it does with other farm stock.

Incidentally there is no fumbling around with extension cords when it's time to set up some pig brooders. The farrowing houses are wired to provide a double convenience outlet for each pen. These are placed so that the cord supplying each pig brooder is back of the barrier where it cannot be disturbed.

Lamb Brooders Are Similar to Pig Brooders

Electric heat is also used in taking care of baby lambs. Lamb brooders, heated in a similar manner to the pig brooders, are used to warm up and dry off the lambs born in late winter and the early spring. These are . . . . (More on page 19)



Above: Marvin Wix installing a pig brooder. The 2" x 6" guard rails on the side walls are permanently in place. The triangular top is laid on them, the lamp plugged in and put in place over the opening. **Left:** The barrier is set in place on the guard rails and held there by two hasps and staples. The lamp and wiring are protected from pigs and sow. That's all there is to it. **Below:** Happy lamb. The ewes as well as the lambs seem to approve of the brooders.

*U.S.D.A. Agricultural Statistics 1942, p. 408, Table 527.

Electrical Housekeeping

Edited by **GAIL MEREDITH**

West Virginia Housewives Study

COOK STOVES

BEFORE everyone's extra time and attention was turned to ways of winning the war, Miss Adele Bigelow, Rural Home Counselor for the Monangahela West Penn Public Service Company, persuaded a group of women to work with her on a study of the work it takes, and the time it takes, and the money it takes to do certain household jobs.

In the study of cook stoves, for instance, each woman kept records for six months on the use of the fuel she was in the habit of cooking with, and then for another six months, on cooking with electricity.

These were busy women and like all farm homemakers, they always had plenty of work of their own to do. Their willingness to undertake this study for the benefit of all farm women planning to buy electric equipment showed a generous spirit. The facts they discovered offer a basis of comparison which will help any woman weighing advantages and money before she buys.

When Miss Bigelow sent me the tabulated results of these experiments she wrote: "I should like to comment on the spirit in which these women did this work. It is true that they received a reduction in prices of electrical equipment which supplanted their old method of work. However, the majority of them did it on an experimental basis to try to find out facts for other farm women to use in making their judgments concerning investment of money."

Mrs. Paul Sharp lives in Pocahantas County; there are five in the family, three adults and two children. When she cooked with a coal stove, she found that it cost her $25.42 a year, that it took her 90 hours and 44 minutes just to run the stove, and that she walked more than seven miles and a half to carry five tons of coal to the stove.

But here is the record set down plainly for you to study.

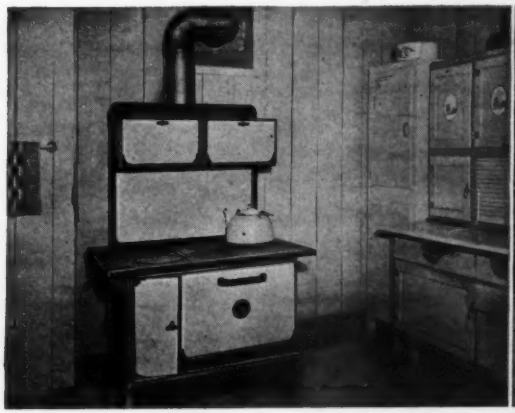
COAL STOVE

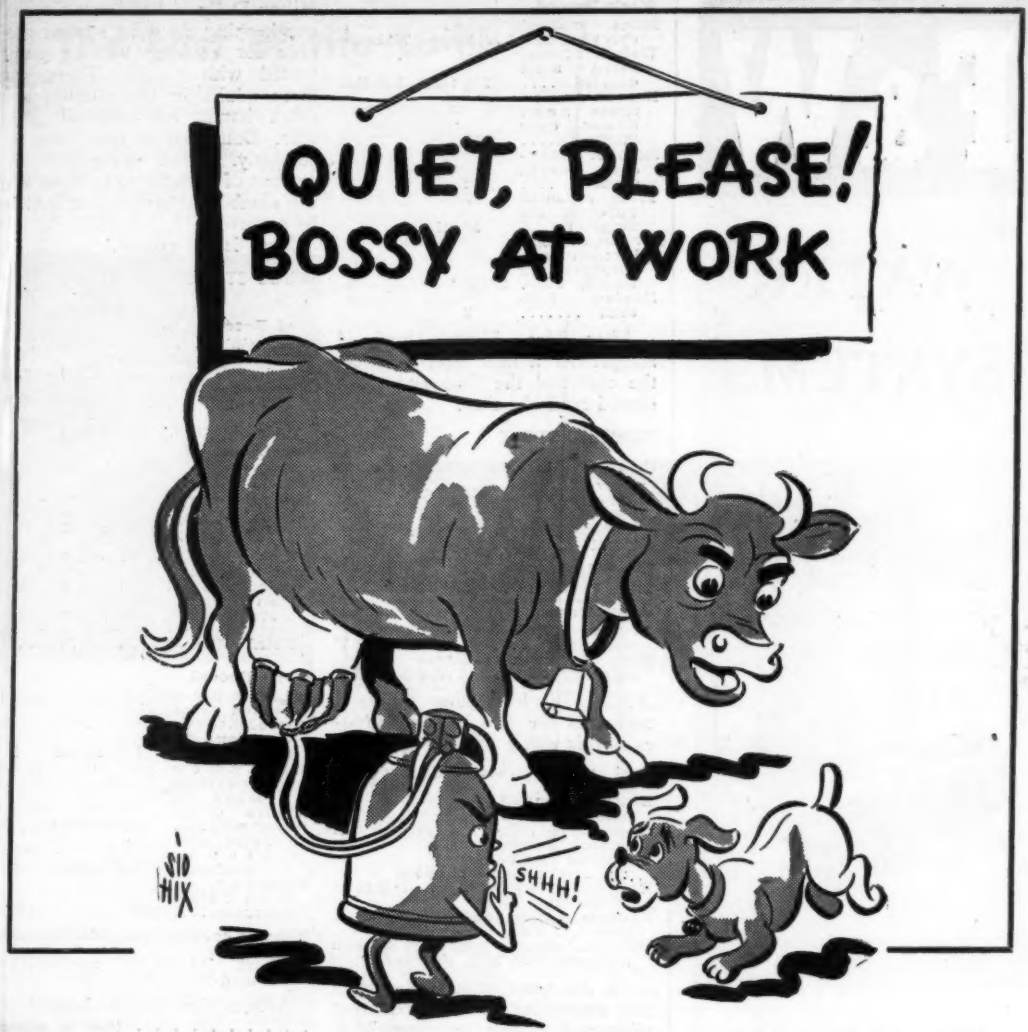
	For Six Months	Per Month
77.83 bu coal @ 15c per bu	$11.67	$1.93
32 qts of kerosene for starting fires @ 13c per gal	1.04	0.17
Total cost	$12.71	$2.12

Time Record

Time to carry coal	6h 8m	1h 2m
Time to build fires	13 49	2 18
Time to clean ashes	13 23	2 14
Time to clean stove	12 1	2 0
Total time to operate stove	45 22	7 34

Left: The Sharp kitchen when the coal stove study was being made. It was always immaculate but was not convenient. The sink (not in the picture) stood against the wall facing the cabinet. The light was poor at the cabinet and not too good at the stove. The metal cupboard beside the cabinet was used for dish storage. **Right:** When the electric range was put in, the Sharp kitchen was also rearranged for greater convenience. The kitchen cabinet was divided and stands where the coal stove stood. The sink stands in an alcove between work centers that was formerly a little used closet. The window back of the range now gives cross-ventilation. Formerly it blew soot out of the stove if it was opened. The sink previously stood where the range now is. The new arrangement has greatly reduced the time and walking distance in preparing food in addition to savings made by the electric range. The dish cupboard is to the left of the range within two steps of the breakfast table, and a new refrigerator stands where the cabinet had been.





Your dairy herd deserves the best of care today. This means the cow should like the milker, both man and machine. Another important point: *There should be no distractions in the barn at milking time.*

Anything which disturbs the cow or upsets her routine just before or during milking interferes with the natural "letting down" of her milk. Strangers, children and dogs should not be allowed in the stable if the herd is to maintain a top level of production.

If you have a McCormick-Deering Milker, check it regularly and guard its many "cow comfort" features. If you need a new McCormick-Deering Milker, see the International Harvester dealer about the availability of new machines. Ask the dealer also for information on making application for an International Milk Cooler.

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McCORMICK-DEERING MILKERS

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WATER SYSTEMS

This new streamlined "Bullet" model centrifugal pump for shallow wells is compact, efficient, has fewer moving parts. Pumps more water, at less cost. Embodies 78 years' experience. Available under existing priority rules. Ask your dealer.

FLINT & WALLING MFG. CO., INC.

395 OAK STREET, KENDALLVILLE, INDIANA

Work Record		
Miles walked carrying coal	3 9/11	7/11
Weight of coal lifted and carried	2½ tons	834 lbs.
Number of times soot blew over kitchen	10	
Number blackened kettles scoured	52	
Time to cook potatoes for mashing ...	50 min	
Average high kitchen temperature per month	102½ °	
Baking failures	2	

After Mrs. Sharp's husband bought her a new electric stove, the cost and the time and work record read like this:

ELECTRIC STOVE

Cost Record	For Six Months	Per Month
24 kw-hrs @ 4.5 c....	$1.08	$0.18
285 kw-hrs @ 3.0 c....	8.55	1.43
120 kw-hrs @ 1.75c....	2.10	0.35
Total Cost.....	$11.73	$1.96
Time Record		
Time to clean stove..	3h 25m	34m
Work Record		
Average high kitchen temperature	82°	
Time to cook potatoes for mashing 35m		

Miss Bigelow sums up and compares the two cooking processes this way:

Coal range costs 98c more to operate.
Electric range reduced time operation ....41 h 57 m 7 h 0 m
Electric range reduced mileage .....3 9/11 miles
Electric range eliminated heavy lifting and dirt.
Electric range reduced cooking time 1/3 plus.
Electric range reduced kitchen temperatures 20½ degrees.

At the same time Mrs. Sharp was measuring coal and counting trips and timing cleaning, Mrs. Milton Dolly of Pendleton County was keeping the same sort of records for cooking with a stove heated with wood. There are three adults in this family, and extra hands for seasonal jobs. Mrs. Dolly has a good deal of company. That increased the amount of cooking to be done and the number of kettles that had to be scoured.

Here is the record.

WOOD STOVE

Cost Record	For Six Months	Per Month
Wood slabs	$6.50	$1.08
Time to saw and split 60 hrs @ 30c.....	18.00	3.00
Kerosene—12 qts @ 3 1/3c per qt.....	0.42	0.07
Total Cost.....$24.92		$4.15
Time Record		
Time to carry wood from wood house to wood box	22 h 40 m	3 h 47 m
Time to build fires	12 33	2 5
Time to clean ashes	6 30	1 5
Time to clean stove	45 30	7 35
Total Time	89 13	14 52
Work Record		
Distance walked from woodshed to woodbox 50 ft. one way.	12 miles	2
Distance walked from woodbox to stove 4 ft. one way....	3 1/3 miles	½
Total distance walked .	15 1/3 miles	2½
Number of kettles scoured 1023		170

Time to cook potatoes for mashing 40 min.
Highest kitchen temperature reached 94°.

When the Dollys bought an

. . . . . (More on page 26)

TRUMBULL BROODING EQUIPMENT

Designed and Constructed for Dependable Results

TRUMBULL All-Weather Brooder

Capacity 300 to 400 chicks $37.95

The conditions under which your chickens are brooded will determine how they develop, live and produce. Properly heated fresh air as provided by Trumbull Brooders means higher livability, more uniform growth and the robust health necessary for sustained egg production. Trumbull is cooperating with poultrymen by manufacturing Brooders and Brooderators to the full quotas established by Government authority.

The TRUMBULL ELECTRIC MFG. CO.
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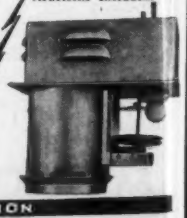
TRUMBULL Brooderator

To be installed in home made hover. $19.80. Instructions included.



A GENERAL ELECTRIC ORGANIZATION

The Last of the Lamb

EVEN small families like a leg of lamb now and then, a tender, thick-meated roast, with edges of fat turned crisply brown, and just a faint elusive hint of that clove of garlic thrust in close to the bone, and giving enhanced

flavor to the whole; or coming to the table with a delicate glaze made by spreading the meat with a cup of currant jelly for the last of the roasting. But it takes a certain amount of culinary ingenuity to make that lamb welcome day after day, till the last morsel and the bone goes into a pot of baking lima beans.

Cold sliced lamb tastes good, but repeated appearances are monotonous even if the lamb is served up with mint jelly or freshly picked sprigs of parsley from your flower pot window garden.

You Throw It Together

I have two friends who have invented their own versions of lamb stews to use the meat that might dry on the bone. Helen swears she has no idea *how* she makes a stew. "It's never twice the same. It's just one of those dishes you throw together in desperation half an hour before dinner."

That is what she *says*.

As a matter of fact, though she does put that stew together without thought today, that's the result of habit. Her lamb stew is always the same, and always an invitation to gluttony.

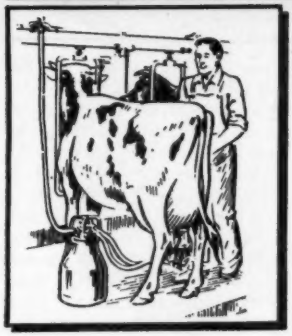
She begins her preparation for that later stew the day she cooks the leg of lamb. She does it by making a huge bowl of gravy, far more than they will eat for dinner. Then when the day for the stew comes, she begins with that gravy, thinning it as need be, and cutting into it pieces of lamb to heat. She sometimes adds potatoes with the lamb, but she cooks carrots and onions separately, adding them to the meat just before she takes it to the table. This is her way of making sure they will not be overcooked.

When we follow her recipe nowadays, we will probably add carrots and onions to the stew directly and watch the clock to make sure they do not cook too long.

May Add Curry Powder

Sometimes Helen adds curry powder to the stew before she pours it over a plate of rice. She uses just a quarter of a teaspoon of the curry powder when she is planning for four. That is to please her husband who is wary of curry. If the stew is planned for guests with a marked fond-

A GREAT ADVANCE *in* MILKING



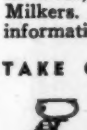
THE DE LAVAL SPEEDWAY METHOD OF FAST MILKING

- *MORE MILK*
- *TIME SAVING*
- *LESS STRIPPINGS*
- *HEALTHIER UDDERS*
- *BETTER SANITATION*
- *PLEASES THE COW*

The De Laval Speedway Method of Fast Milking . . . . consisting of six easy steps . . . is the greatest advance in the science of milking since the introduction of the modern milking machine. It accomplishes all of the highly important results shown above . . . . by fitting the milking operation to the cow's natural principles of milk "let-down" and ejection.

Any dairyman using a milking machine can improve his results by following the De Laval Speedway Method of Fast Milking . . . . which, however, is most effective when used with the fast milking De Laval Milkers. Write your nearest De Laval office below for complete information on the De Laval Speedway Method of Fast Milking.

TAKE GOOD CARE OF YOUR DE LAVAL SEPARATOR



Some new De Laval Separators will be available . . . . but the quantity we are authorized to manufacture will not be sufficient to meet all needs. Observance of the following points will help your present De Laval to give you the longest, most efficient service which was built into it.

1. Use only De Laval Separator Oil and carefully check lubrication system as directed.
2. Be sure to wash bowl and tinware immediately after each time separator is used.
3. Turn bowl nut down firmly.

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SHEAR YOUR SHEEP *with* STEWART *famous* SHEARMASTER

MORE WOOL
MORE PROFITS
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Gets 10% EXTRA WOOL . . . important now when War Effort NEEDS every available pound! Ideal shearing machine for the farm flock. Easy-to-use. Rugged, built-in durability. Shearmaster only $26.95 complete with 2 combs and 4 cutters. Slightly higher West of Denver. 100-120 volts. Special voltages slightly higher. Ask your dealer. **Supply limited by quota.** Write for new Stewart bulletin, "Harvesting the Farm Flock Wool Crop," and FREE catalog of Stewart famous Clipping and Shearing machines.

No Priority Rating needed for shearing. Sale not restricted by county rationing boards.

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Over Half a Century Making Quality Products

ness for curried dishes, she doubles the amount, adding half a teaspoon of the powder.

"Try it yourselves," she always warns her friends, "You can find out soon enough how much your folks like. Then stick to that amount."

Sometimes she leaves the curry out entirely, but moves the stew from kettle to casserole so she can cover it with tiny baking powder biscuits to be baked ten or twelve minutes in a 400 degree oven.

Another friend is inclined to attribute the success of her sophisticated stew entirely to sieved egg yolks. Anyway don't leave them out and think you'll get the same results.

She starts out by frying sliced onions in the best shortening she can spare. It was butter in the days when butter was possible. If they are in season, she adds a bowl of fresh mushrooms. If they aren't, or if the fresh ones are too expensive, she uses the canned variety instead, browning them delicately with the onions. Then she pushes both mushrooms and onions to one side of the skillet and makes a rich white sauce with the fat.

Next she adds chopped lamb and chopped egg whites. The number of boiled eggs she uses differs, of course, with the size of the stew—and the price of eggs. While they are heating she snips up a few slices of green pepper and adds them to the sauce for looks and taste.

Of course, she is like any other good cook, if she hasn't the mushrooms she goes on without them. If she hasn't green peppers, she may chop up a couple of stalks of celery to take its place, or she may go right ahead and finish the stew without it. But while the thickened stew simmers and bubbles on the very lowest heat of the smallest burner of her electric range, she pushes the yolks of several hard cooked eggs through a sieve, salts them lightly, and adds them just before she takes the stew up, saving enough to dust over the top after the stew is in the serving dish.

Serve on Hot Toast

She keeps a toaster in front of her and serves each delectable ladle of stew on piping hot whole wheat toast. A tangy salad of grape fruit and orange slices on plenty of lettuce, or shredded cabbage with a sour cream dressing completes the meal for her family.

I don't know how you feel about it, but it seems to me it's quite a cook who can make the last of the lamb taste as good as the first.

This Is

AMERICAN RED CROSS

War Fund Month

The Red Cross is one of the best friends our boys in the service have. What we give helps them.

Give!

When your electric fence is properly built and Prime supplies the "wallop," you've got a combination you can count on. During the past ten years, thousands of farmers have learned to depend on Prime high-line and battery controllers. See your Prime dealer.

Prime High-line Model.

THE PRIME MFG. CO., Milwaukee 4, Wisconsin

"Our Electric Washing Machine"

December Letter Contest Winner

Although our washer does the laundry for eight people, it does the job perfectly because of "team-work."

I sort the clothes according to soil, color and material. Only clothes which require the same TEMPERATURE and same type of soap are washed together.

I do not soak clothes except stained or unusually soiled. I do not overload the machine and do watch the suds. I use hard, hot water with home-made soap chips in the washer.

This way my machine washes so well I need do no rubbing as they come clean and smell fresh and sweet.

I rinse clothes twice—the second tub has a little bluing added. I prefer to have rinse water warm. It is easier on my hands, rinses soap out better, and makes clothes dry faster.

We wash twice weekly and I couldn't manage without the washer. It has taken the worry and work out of wash day. It gives me a thrill to see my six long lines hung full of bright and snowy wash with so little effort on my part.

MRS. JOHN F. NEISE,
Box 275, Sauk City, Wisc.

Contest Letter for Month

How does electricity help you most?

In these days when minutes and strength are never quite enough to meet the demand, there is more need than ever to make full use of the help electric power can give you in your home. In order that the ways you have found useful may help someone else get a day's work behind her more easily, and more quickly, we are asking you to tell us how electricity helps you most. Just write us a brief letter, telling it clearly and definitely. We will send the writer of the letter that seems to us the most helpful five dollars' worth of War Stamps.

Address your letter to Gail Meredith, 700 S. Mills Street, Madison, Wisconsin. It should reach her by March 31st.

Pig and Lamb Brooders

. . . . . (Here from page 13)

a real convenience since about the only other way of take care of a weak lamb is to carry it into the house and warm it up by the kitchen stove. With the brooders the heat is provided right in the barn where it's needed and may be left on as long as desired at no inconvenience to anyone.

Like the pig brooders, their construction is simple but practical. The lamb brooder is an open front box made without a bottom, about three feet long, two and a half feet high, and two feet deep. Plenty of clean litter is used to make a warm bed underneath the brooder. An opening is cut in the top smilar to that of the pig brooder, and this is screened by tacking one-half-inch mesh hardware cloth over the opening on the under side of the top. The heating unit like in the pig brooder is a conical metal reflector with an ordinary 200 watt, 120 volt inside frosted Mazda lamp, which rests over the screened opening.

The lambs are placed under the brooder as soon as they are born,

Here's a "Hired Hand" for Routine Work!

A Fairbanks-Morse General Purpose, Single-Phase, Induction Motor is the most efficient "hired hand" that you can have around your farm!

It's the motor that lasts longer—delivers dependable, low-cost power for all those extra jobs that take more time than you can afford to give them.

Fairbanks-Morse Single-Phase Motors, built in both open and splash-proof design are recognized as one of the most profitable farm investments that can be made.

Ask your dealer about Fairbanks-Morse Motors, single-phase or polyphase, all sizes—or write Fairbanks, Morse & Co., Chicago 5, Illinois.

FAIRBANKS-MORSE
Motors

RUNNING WATER
PLUS
DEMING VALUES
MAKE PROFITS!

RUNNING WATER has proved itself to be a sound investment for maintaining better sanitation in farm buildings, for increasing farm yield, for fire protection, for doing more work with less effort. When you invest in a Deming Pump or Water System, you have *RUNNING WATER AT ITS BEST!*

The Key to Economy

DEMING JET PUMP

Here is the Tops in the modern Jet-type Pump. For wells where total lift is from 15 to 180 ft. Capacities: 200 to 4500 gallons per hr. Two-pipe and Single pipe types in the Complete Deming Line.

DEMING FEATURES

TAPERED Stainless Steel Shaft; slotted compression type sleeve coupling; air release tube; automatic balanced regulator; patented single pipe ejector; and all other modern features that make this Deming Jet Pump a SOUND INVESTMENT! Write for illustrated Bulletin J-4900-B.

THE DEMING CO.
344 Broadway
SALEM, OHIO, U. S. A.

Buy **DEMING** *FOR Values*

and the front is covered with a couple of burlap bags until the lamb is dried off and thoroughly warmed up. Then the bags are removed and the front of the brooder is kept open thereafter. The lambs appreciate the warmth and until they get a little strength will spend most of the time resting under the brooder lamps. The brooders are left on for about five days, which is sufficient to put the lambs in good condition.

The lamb brooders are made of any light weight lumber or insulating board. They are nailed to a side of the pen, and the rubber-covered lamp cords are tied securely so that the lamps cannot be knocked off into the floor litter.

Hay Curing in Virginia

. . . . . (Here from page 10)

unloading the green hay onto the ducts.

Records for the 1942 season on 1005 tons of mow cured hay showed that the kilowatt-hours per ton varied from 32 to 96, averaging 53 kw-hrs per ton for all the systems. Farmers agree that an operating cost of from 75¢ to $1.50 per ton is a small sum to pay for the labor and hay saved plus the improved quality of hay obtained by use of the forced ventilation method. The operating cost varies with the outside weather conditions and the moisture content of the hay.

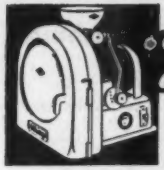
To Warm Your Boots

On a cold, frosty morning just slip a 150 w. lamp on an extension cord down inside your cold boots for a few minutes and you can start the day's work with warm, comfortable feet. — C. O. Nungezer, R 1, Charleston, S. C.

In such horse-drawn machinery as the mower where the weight of the driver helps to balance the weight of the tongue, you will have fewer sore necks on your horses if the seat is adjusted forward or backward or weighted so the driver will just about balance the tongue.

The Bond you buy over here—may save a life over there!

★ **BUY BONDS** ★



Save
LABOR
TIME-EFFORT

GRIND YOUR OWN FEED
WITH A VIKING HAMMER MILL

1 **LABOR FREE GRINDING:** Just fill the hopper and snap a switch. It grinds while you do other chores.

2 **LOW COST:** Grind your own grain with a Viking for as little as 1¢ per 100 pounds—and have more nutritive fresh ground grain, too!

3 **SAVES LABOR, TIME, EFFORT:** Yes, and money, too. You'll wonder how you ever got along without your Viking Hammer Mill.

NOW: A few are being made. Get yours when you need it most. Write TODAY!

Viking

VIKING MANUFACTURING COMPANY
221 EAST WASHINGTON ST. JACKSON, MICHIGAN

Remember the LYON Line when you want quality and time-saving advantages.

28 YEARS OF SPECIALIZATION IN *ELECTRIC* BROODING (and Electric Poultry Supplies)

FIRST in successful *nation-wide* electric brooders
FIRST in *cold room* electric brooding
FIRST in commercial *fan ventilated* brooders
FIRST in *infra-red ray* brooding
FIRST in *electrification* of fuel heated incubators
FIRST in *electrifiers* for homemade brooders
FIRST in *low temperature coils* for accurate temperature control in incubators and brooders
FIRST in *dimmer resistors* for poultry lighting
FIRST in *sturdy fly electrocutors* for poultrymen
FIRST in an *inexpensive 12 amp thermostat* for food dehydrators (130°-200°)
FIRST in special electric *burglar alarms* for poultrymen
FIRST in *dust-proof self-cleaning* fan heaters for electric brooders

. . . AND NOW

FIRST in *electric De-beak-ers* for more efficient poultry feeding and elimination of picking

LYON RURAL ELECTRIC CO.
Dept. EF SAN DIEGO, CALIF.
(Eastern Branch: Greensboro, North Carolina)
Ask leading poultrymen from Coast to Coast . . . or write for catalog

Questions and Answers

Electrocutor for Sparrows

▶**Question:** *Do you know of any arrangement with electric wires that can be used to electrocute English sparrows? I have been told that flies have been electrocuted by charged wire netting. Would something like this work with sparrows?*
W. L. M., Mo.

▶**Answer:** I do not know of any device for electrocuting English sparrows. If there were such a device it would probably not be legal to use it because it would not distinguish between sparrows and birds which are protected by law.

Yard Light Control

▶**Question:** *I would like to know if I can hook up a light on the end of the barn and have a switch to put it on and off from house or barn. There are two wires going to the barn now. By running an extra wire, could I wire it so I can put it on or off at both places?*
E. E. B., New York

▶**Answer:** A yard light to be controlled both at barn and house can be wired with one wire additional to the two already in place only if the barn equipment is included in the yard light circuit. This, of course, is impractical and the answer to your inquiry, therefore, is that two extra wires be strung between house and barn for two-station switch control of your yard light.

This arrangement includes the use of one of the wires already in place since approved three-way switch wiring necessitates the use of three separate electric current paths. The April 1942 issue of ELECTRICITY ON THE FARM gave wiring diagrams for different hook-ups of yard lights and control switches.

Farm Fire Protection

▶**Question:** *I have an automatic electric water system consisting of pump and pressure tank of 43 gallons. The pump starts at 20 lbs. and cuts off at 40 lbs. pressure. I really need a larger tank.*

I have been thinking of installing a large reserve tank for use against fire. This tank would have 100 feet of 1½-inch hose connected in series with a centrifugal pump and the tank.

What size tank and pump should I use to get the proper pressure and flow in my hose? Would such an outfit be too expensive for fire protection?

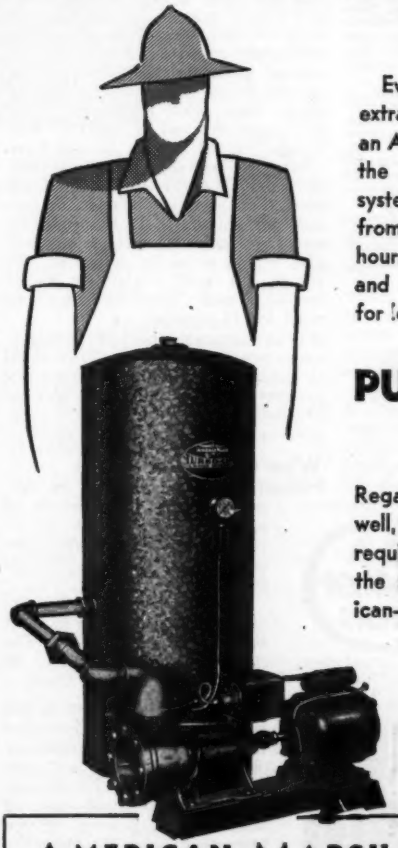
If you have any better ideas on this matter, they will be cheerfully received. H. H. C., Ga.

▶**Answer:** This matter of fire protection on the farm has a number of angles. We can only give you our point of view; others might have different recommendations.

The automatic electric water system gives good fire protection if you can get there quickly with the water after the fire starts. This means that you must have hose connections and hose handy at the places where fire is most likely to start. Once a farm fire gains headway the ordinary 250-gal. per hr water system will help in protecting other buildings but will probably do little toward extinguishing the fire.

The question of whether to use a large pressure tank for fire protection is debatable. Any tank working between 20 lbs. and 40 lbs. pressure will deliver from one-fourth to one-fifth of its capacity. That is, a 500-gallon tank would deliver from 100 to 125 gallons at pressures between 20 lbs. and 40 lbs.; that is about two barrels of water. Personally, I think would rather put the cost of that large tank into a water system of larger capacity so you would depend upon the pump rather than the tank for your supply. This, of course, would be contingent upon

WORTH AN EXTRA MAN ON THE FARM!



Even if you CAN'T find an extra man . . . you CAN get an American-Marsh pump to do the work of one! Turbo-Lift systems are available in all sizes from 300 to 2800 gallons per hour. The pump is noiseless . . . and *has only one moving part* for long, trouble-free service.

PUMPS - - - FOR ANY WELL

Regardless of the depth of your well, its size, amount of water required, or pressure desired at the surface, there's an American-Marsh pump for the job.

★ SEND FOR FREE BULLETIN

AMERICAN-MARSH PUMPS, INC.
BATTLE CREEK, MICHIGAN, U. S. A.

New money-saving, time-saving Deltacraft book —
"How to Get the Most Out of Your Farm Workshop"

Only 25c for 40 pages of tool tips, plans and pictures . . .

Packed with facts and practical help. Published by Delta, world's largest maker of power tools for home and farm workshop (now 100% in war work). How to lay out your shop, do repairs and new construction faster, safer, easier — saving time, money, and mileage to town. *Power Tools and Their Uses.* Illustrated descriptions and instructions. Circular Saw, Jointer, Grinder, Drill Press, Band Saw, Lathe, Scroll Saw, Sanders, Shaper—for working wood, metal, plastics. *Plans and Projects.* How to splice timbers; how to build self-feeder, hog house, feeding barn, chick feeder, gates, etc. . . . *Beautifying your home* — making furniture, etc. . . . Plus shop layout pictures, tables on nails, screws, hinges. Make yours a shop to be proud of, where it's fun to work . . . Send 25 cents in coin or stamps to—

DELTA MILWAUKEE Power Tools

The Delta Mfg. Co.
727 B E. Vienna Ave.
Milwaukee 1, Wis.

SEND TODAY

pounds per square inch. This will give you a reasonably good stream with which to fight fires. The pump will take care of your ordinary demand for water on the farm at about the same cost for current and will probably have a longer life than a smaller size unit.

It is, of course, advisable to keep rubbish and oily rags cleaned up and inflammable material off from shingle roofs. Chimneys should be checked occasionally and the farm family schooled in being careful. In the case of fires an ounce of prevention is surely worth a pound of cure. Fire extinguishers in convenient places and kept properly charged are also a good safeguard.

For larger fires my recommendation would be to have a tank or reservoir of water from which a local fire department could pump, or to which you could have your own centrifugal pump connected in a way that the pump would be frost-proof and always primed. If you have no local fire department, someone in the community might attach a small centrifugal pump to an extended shaft on the front of an automobile or truck. This could be driven up to the reservoir and a suction hose dropped in the water. If you have a barn fire you need large quantities of water. A 1½-inch centrifugal pump will give you about 225 gallons per minute. A 2 hp electric motor on this 1½-inch pump will give you a pressure of 50 lbs. per sq. in. A tank 10x10 feet and 4 feet deep would keep the pump supplied for 12 minutes.

Local or community fire departments are very desirable. They could be equipped with high pressure fog systems as described in our December issue.

having an ample supply of water available for the pump running at full capacity, and having the pump located in a place and in a manner so that the power would not be likely to be cut off during the fire.

A 500-gallon per hour pump will deliver about 8 gallons per minute. If you use a 1½-in. hose and ¼-in. diameter hose nozzle, the pump will maintain a pressure of about 18

HERE'S A MONEY-MAKER FOR FARMERS

You can have water where and when it's wanted with a BURKS Water System. This means you'll put meat on beef and hogs faster — increase milk up to 20%, eggs up to 35%.

BURKS WATER SYSTEMS

Super Turbine System

are famous for dependable service —longer life—and larger capacity. Only one moving part—self priming—easy to install. Both deep or shallow well systems. Write for catalog and prices now.

DECATUR PUMP CO., 13 Elk St., Decatur 70, Ill.

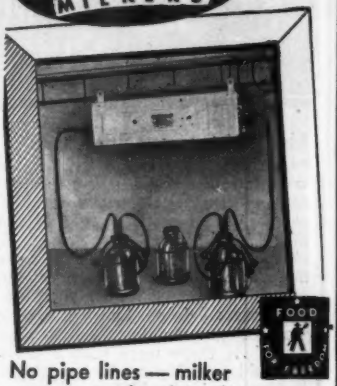
Wire to Hotbed

▶**Question:** *I recently built an electric hotbed. The wire is* 14 *gauge and there will be* 72 *outlets for* 25*-watt bulbs. The bed is approximately* 175 *feet from the house.*

I want to know if the current is strong enough to light the 72 *bulbs at once? The current is standard power of* 110 *volts.* S. S. Conn.

▶**Answer:** I am sorry to tell you that your electric hotbed will not operate satisfactory on No. 14 wire. You will need No. 6 wire for 72 25-watt lamps. You could use 62 lamps on No. 8 wire. If you attempt to use No. 14 wire you will not get sufficient heat in the hotbed and you will also be paying to heat up the wire leading to the hotbed.

Clean-Easy MILKERS



No pipe lines — milker runs on overhead track —up out of the way. "Clean-Easy Trackster" is sanitary, easy to keep clean, milks fast. Your youngster can operate it. See your nearest dealer before his allotment is sold. Ben H. Anderson Mfg. Co., Madison 3, Wisconsin, Dept. 234.

AMERICA'S FAVORITE MILKER

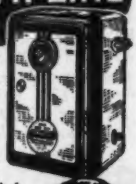
Electric Tobacco Curing

▶**Question:** *Can you cure tobacco with electricity? How much will it cost to cure a barn of tobacco in a* 16 *ft. barn?*

J. L. W., North Carolina

▶**Answer:** Burley tobacco has been cured with the aid of electric fans and I believe some other types have been experimented with. The subject is still in the experimental stage so I cannot give you the cost of curing tobacco by this method. You can get information on the subject by writing to the Tobacco Experiment Station at Greenville, Tenn., or to the Experiment Station, University of Kentucky, Lexington, Ky.

Get A Gardner Hi-Line Controller



Save time, get set for more milk, beef or pork production with a Gardner hi-shock hi-line controller — the best engineered electric fence unit. Thousands are in nation-wide use, many have given six years of successful service. Ask your dealer today, or write direct for free folder.

For Sale Now!

Gardner Mfg. Co.
5313 Kansas St. Horicon, Wis.

A 15-Hen Laying House

By M. M. JOHNS

THIS laying house is of two story construction 4′ x 8′, each story two feet in height. The first floor is used for feeding and watering and second story for nests and roosts. The basement or ground

floor is used for keeping young pullets until they begin laying. The chickens go from first floor to second by means of a chick ladder at one end of the house. One-inch mesh chicken wire is used on back as in front during summer months for cross ventilation. Two solid wood panels (2′ x 8′) are hung on back during cold months (similar to window screens) and feed bag curtain is hung in front at night.

This hen house is made of one-inch shiplap boards and is portable. The top, back and both floors are removable. The four nests are made of ordinary orange boxes.

Ten hens were purchased on June 16 for $16.25. These were sold on September 16 for $18.00 to make room for ten March pullets. Five June pullets were added to the flock in October to be ready for egg production in December.

The flock of 10 hens from June 16 to November 16 averaged 67.5 per cent production. They laid 1032 eggs during the five months.

The feed cost is held to a minimum by feeding tender green clippings caught when the lawn is mowed. All edible table scraps are fed to the hens. Night lights were turned on the pullets the first of October. The electric Debeaker, as described in October issue of "Electricity on the Farm," was used to debeak the 15 pullets.

Record as of June 16, 1943 to November 16, 1943 Five Months

Expenditures

Hen House Cost	$15.66
Water fountain	1.50
10 hens (65 lbs. @ 25c	16.25
15 baby chicks @ 12c	1.80
Total Feed Cost (10 hens and 15 chicks)	36.80
	$71.91

Value of Project

86 doz. eggs @ 45c. doz.	$38.70
10 hens sold Sept. 16	18.00
15 hens on hand @ $1.50 ea.	22.50
1 hen house	14.00
	$93.20
	71.91
Returns over cost	$21.29

There are many 4-H and FFA boys who could build a hen house similar to this one and afford to keep a small flock of good layers.

Sergeant: "Did you shave this morning?"

Private: "Yes sir."

Sergeant: "Well, next time stand closer to the razor."

SANI-MATIC
(Sanitary & Automatic)
ELECTRIC WATER HEATER FOR THE MILK HOUSE

Exclusive Advantages:

- TEN FULL GALLONS* of HOT WATER available THREE TIMES DAILY and the LAST DROP is as HOT AS THE FIRST.
- EASY ACCESS FOR CLEANING.

*Also 18 Gallon size available.

Write today for descriptive folder.

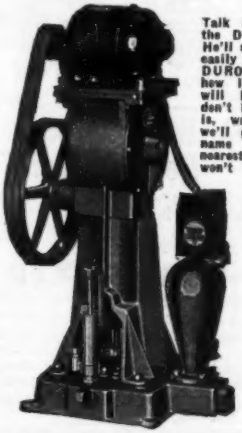
THE SCHLUETER CO.
JANESVILLE, WISCONSIN

Storms MAY ROAR BUT THEIR WATERS ARE TURNED TO SERVE YOU

Yes, by simple twist of the wrist you can have as much of this water as you want, when and where you want it.

The renowned DURO Pump and Water System makes all this possible. Designed for shallow wells or deep wells, DURO delivers water in large quantities to increase farm production. A DURO Water System also modernizes the farmer's home by giving him a modern kitchen, bath and laundry. It does all this year after year dependably, economically, and with the minimum of care and attention. And you'll be amazed at the time and work it saves you.

SEE THE DURO MAN



Talk it over with the DURO dealer. He'll show you how easily you can have DURO benefits and how low the cost will be. If you don't know who he is, write us and we'll give you the name of the one nearest you and you won't be obligated in any way. New installations now available under the farm order.

THE DURO COMPANY
Dayton 1, Ohio

DURO Water Systems

International

"SHOK - FENCE" CONTROLLER

Superior to many selling for much more money. Provides farmer low cost fence with full control of stock. Capacity charge always on fence. Strong shocks, greater penetration, yet the safest unit made.

LOW COST - - NO MOVING PARTS
User Can Replace Parts Which Wear

Precision Built - Heavy Case - Replaceable Indicator glows only when fence is shorted. Oil-filled type Condenser insures long life. No Moving Parts - No Radio Interference Operates at any angle.
Model AD-31—110 to 120 Volt A.C.

Approved - Guaranteed - Insured
At Your Dealer or Write for Folder E-3

International Electric Fence Co.
910 W. Van Buren Street - Chicago, Ill.

When Quality Decides Profit

Your profits increase when tests show milk deliveries clean and low in bacterial count. It's easy to do with sanitary methods and daily use of the new improved

RITE-WAY MILKER

—widely known for its gentle, *correct milking action*. Individually designed *inflations* and *reciprocating pulsator*, without springs or gaskets, give this exclusive milking action. Our latest *booklet* gives safe short-cuts to increased output and better profits from your present herd. *There is no substitute for a Rite-Way.*

Ask your dealer to place order *now* for earliest possible delivery. Rubber parts for all makes are available. Write for *FREE* booklet.

RITE-WAY PRODUCTS CO., Inc.
Dept. T, 1847-49 Belmont Ave., Chicago 13, Illinois

Rite-Way Branches: Syracuse, N.Y. and Oakland, Calif. In Canada: Massey-Harris, Toronto.

Mr. Gust scooping corn into the hopper of his improvised barn-filling elevator.

Electricity Aids in Emergency Corn Storage

By GEORGE R. HARRISON

Edward G. Gust of near Westville, Indiana, bought another farm. It had an old tumbled - down barn that he was about to tear down, — but he needed storage for 100 acres of corn. After probing about, he found that the old barn had a concrete floor and that the timbers were still sound. On the place were also the remains of two old wood silos. The hoops were still good. If the old barn could be braced, it would hold a lot of corn.

Carl Foldnauer with the electric drill and showing some of the "iron" timbers they had to bore.

The men took out enough manure to cover thirty acres, straightened and rethreaded the old silo hoops and then got busy with an electric drill on the barn timbers. Those old timbers were hard as iron,—entirely too hard for hand boring, but the long shanked auger in the electric drill went through them and the old barn was tied together with the silo rods. It holds 5000 bushels of corn.

The problem of putting the corn into the barn was also solved electrically. Mr. Gust found two

MAKOMB ELECT-O-STAT

FOR BETTER BROODING RESULTS

USES LESS CURRENT

Elect-O-Stat offers the real fan developed air conditioning that brings Best-O-Luck to your chicks. The Elect-O-Stat method (Pat. 2302560) sends vitalized tempered warmth right out to the curtains to stop any cold drafts over your 'downies'. No hot spots, no discomfort inspired crowding. 52" or 60" square, with fan. Also four other models. See your Makomb dealer. Free literature.

THE MAKOMB LINE 6 Madison Ave. Macomb, Ill.

World's Largest Manufacturer of Brooders

old drag elevators in local junk yards. He spliced them together end to end, built a hopper and brought one of his motors from the home place. Holes were sawed through the barn siding to admit the elevator. As the barn was filled, the elevator was moved to new positions.

"It was a lot of work to get the old barn conditioned and strengthened", Mr. Gust said, "but it was worth the effort now when labor is short and materials, too."

A visitor to a new Hampshire farm noticed that the farmer was having trouble with his horse. It would start, go slowly for a short distance, and then stop again. Finally the visitor approached and asked solicitously:

"Is your horse sick?"

"Not as I knows of."

"Is he balky?"

"No, but he is so danged 'fraid I'll say whoa, and he won't hear me, that he just stops every few yards to listen."

A physician visited a country rural school-house to examine the eyes of the children. The teacher next day sent a note to the mother of one pupil saying that he was "not perfect optically." The following day Johnny brought back a reply from his mother, which read:

"The old man whaled Johnny last night and I took a hand this morning, and we think he will be all right from now on, but if he is not perfect optically in the future just let us know."

It's the little things that make the difference

A light over that dark stairway would have saved Bill from being crippled.

•

A few drops of oil may save you from buying a new motor.

•

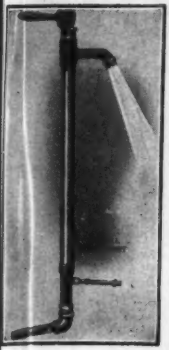
A little thermal control on your motor will keep it from burning out, even if you overload it or forget to oil it.

•

Those few bacteria in your milk utensils that you failed to kill by sterilizing will breed millions of dollar-swipers on a warm afternoon.

VOGEL
FROST-PROOF HYDRANTS

Demand constantly growing.
50,000 already in use.
Ideal for farms.
Will never freeze when properly installed.



Your nearest plumbing supply house handles Vogel Hydrants or write us direct for complete information.

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Write for a free copy of this kitchen-planning booklet.

Now is a good time to PLAN your "kitchen of tomorrow." In such planning, your range will play an important part—and that is why we suggest you write for a free copy of a new Monarch booklet just issued, full of model-kitchen pictures, entitled "Tomorrow's Kitchens." When writing, please also mention the type of range you are now using.

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You'll appreciate the generous and instant supply of clean, sparkling water when you fill your laundry tubs, sprinkle the lawn, wet down your gardens or water your stock — for this amazing pump will deliver 40% more than its rated capacity from ground floor or basement faucets. A turn of the faucet and all the water you want is yours to enjoy, in plenty, for every need including emergency fire protection.

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★ Lifts water 28 feet. Delivers 40% more water than rated capacity from basement and ground faucets.
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★ Top quality specifications. Satisfaction guaranteed.

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Aurora Pump production for war service commands our complete attention, thus the present availability of APCO Water Systems is considerably limited.
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Pattern 4589—Gay contrast adds interest to this youthful frock. Sizes 12 to 20, 30 to 42. Size 16 requires 2⅝ yards 35 inch fabric and ⅝ yard contrast, 16¢.

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Pattern 4630—Clever designing makes this a slimming frock. Sizes 34 to 48. Size 36 requires 3⅛ yards 39 inch fabric, 16¢.

Send orders with coins enclosed to ELECTRICITY ON THE FARM, 196 Pattern Dept., 243 W. 17th Street, New York 11, N. Y. Allow plenty of time.

Cook Stoves

. . . . . (Here frm page 16)

electric range, they bought one with a coal burner attachment to warm the kitchen and heat water for the bathroom and kitchen sink. This small stove took extra work and care. It cost 65c more a month to cook with electricity and to heat the kitchen and to have hot water at the sink and in the bathroom. But it cut down the miles Mrs. Dolly walked while she was getting meals; it cut down the time it took her to keep a fire; and it gave her a cooler kitchen in the summer time.

See for yourself. Here is Miss Bigelow's tabulation.

WATER AND KITCHEN HEATER

Heating stove, bucket-a-day type

Cost Record	For Six Months	Per Month
54 bu coal @ 8.8c per bu.	$4.75	$.79
9 qts. kerosene @ 3 1/3c per qt.	.31	.05
Total Cost	$5.06	$.84

Time Record				
To carry coal.	7 h	24 m	1 h	14 m
To build fires	5	9		51
To clean ashes and stove	15	46	2	38
Total time spent operating stove	28	19	4	43

Work Record	
Distance walked carrying coal.	2 9/11 miles 5/11

ELECTRIC RANGE

Cost Record		
24 kw-hrs @ 5.7 c.	$1.368	$0.23
216 kw-hrs @ 4.5 c.	9.72	1.62
408 kw-hrs @ 3.0 c.	12.24	2.04
24 kw-hrs @ 1.75c.	0.42	0.07
Total Electric Cost	$23.75	$3.96
Total cost coal and electricity	28.81	4.80

Time Record	
Cleaning stove.	30 h 10 m 5 h 1 m

Work Record	
Time to cook potatoes for mashing	25 min
Highest temperature in kitchen	80°

Comparing the work required by cooking with the wood stove and the electric range, Miss Bigelow finds:

- Electric stove plus heating co 65c more a month to operate.
- Reduced the miles walked b 2 1/11 mi per month.
- Reduced the time of operation five hours and eight minut each month.
- Reduced the time for surfa cooking by a third.
- Reduced the average temperatu in the kitchen 14 degrees.

Pattern Book

Only ten cents more for the Ne Spring Pattern Book. Smart, eas to-make styles. Free patter printed right in the book. See ad dress above.

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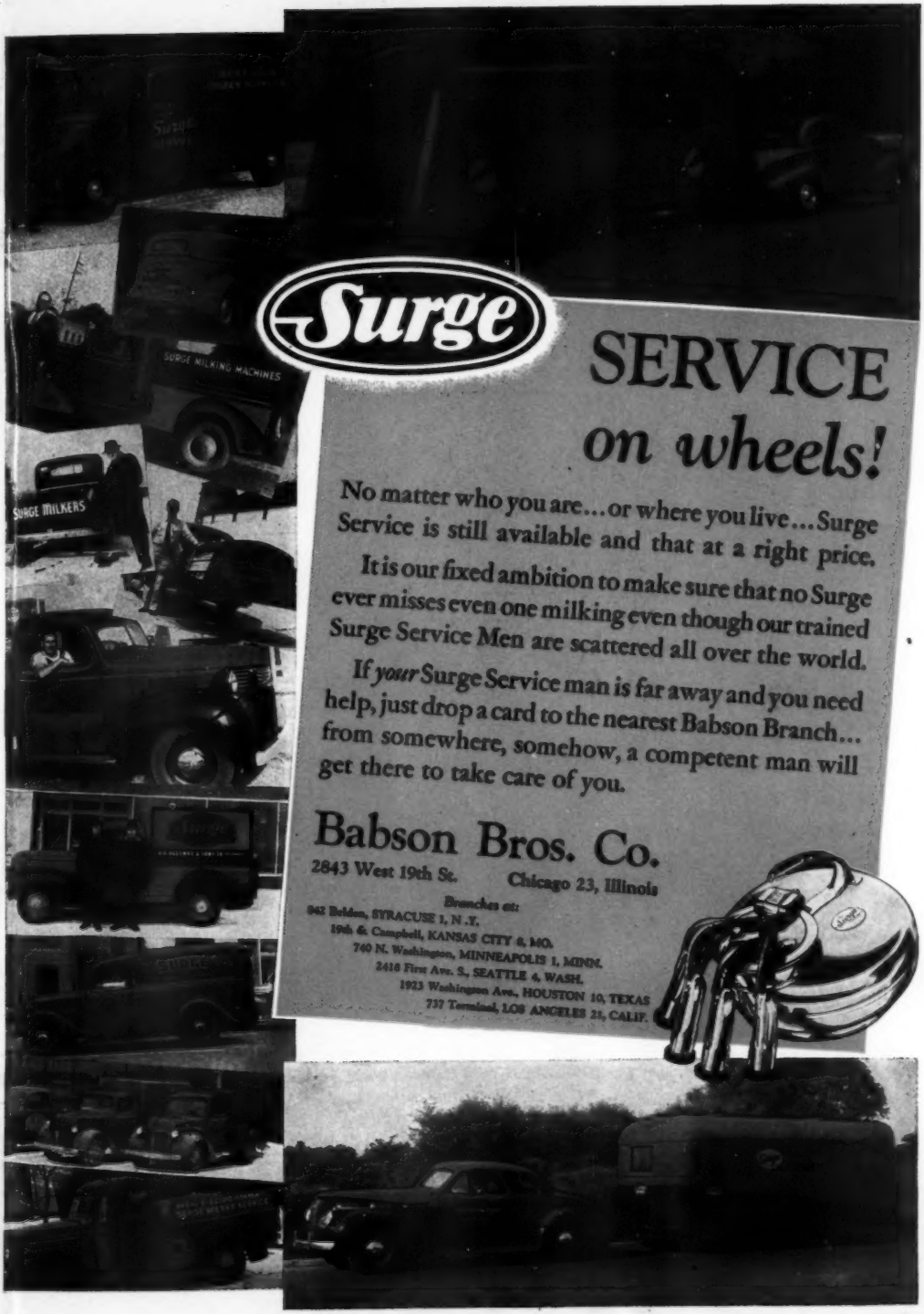

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2416 First Ave. S., SEATTLE 4, WASH.
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